

CLAIMS

WHAT IS CLAIMED IS:

1. A balloon catheter having a distal end, comprising:
 - an elongated catheter shaft having a proximal end, a distal end, a proximal shaft section, a distal shaft section, a guidewire receiving lumen extending along at least a portion thereof to a port at the catheter shaft distal end, and an inflation lumen;
 - a balloon on the distal catheter shaft section and having an inflatable interior in fluid communication with the inflation lumen, proximal and distal ends, a proximal balloon shaft section adjacent the balloon proximal end, and a distal balloon shaft section adjacent the balloon distal end and being adhesively secured to the catheter shaft; and
 - a tip member on the distal end of the catheter having proximal and distal ends and being in fluid communication with the catheter shaft guidewire receiving lumen; the proximal end adhesively joined to the balloon distal shaft section and the catheter shaft.
2. The catheter of Claim 1 wherein the catheter shaft extends distally beyond the balloon distal end.
3. The catheter of Claim 2 wherein the tip member proximal end forms a butt-joint with the balloon distal shaft section.

4. The catheter of Claim 3 wherein the tip member proximal ends extends proximally over the distal end of the catheter shaft.

5. The catheter of Claim 2 wherein the distal balloon shaft forms a lap-joint with the proximal end of the tip member.

6. The catheter of Claim 2 wherein the distal end of the catheter shaft extends distally beyond the balloon distal end in a range from about 1.0 to about 5.0 millimeters.

7. The catheter of Claim 6 wherein the distal end of the catheter shaft extends distally beyond the balloon distal end in a range from about 1.0 to about 5.0 millimeters.

8. The catheter of Claim 4 wherein the proximal end of the tip member extends distally over the catheter shaft in a range from about 0.1 to about 0.5 millimeters.

9. The catheter of Claim 8 wherein the proximal end of the tip member extends distally over the catheter shaft in a range from about 0.1 to about 0.5 millimeters.

10. The balloon catheter of claim 1 wherein the catheter shaft comprises an outer tubular member defining the inflation lumen and an inner tubular member disposed within at least a portion of the outer tubular member and defining at least in part the guidewire receiving lumen, the inner tubular member having a distal end extending through the balloon interior and extending distal to the balloon distal end.

11. The catheter of Claim 1 wherein the adhesive for forming the adhesive seal between the balloon distal shaft section and the catheter shaft extends along the length of the balloon distal shaft section.

12. The catheter of Claim 2 wherein the adhesive for forming the adhesive seal between the catheter shaft and the balloon distal shaft section and catheter shaft section and the tip member

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13. A method of forming a distal tip portion of a balloon catheter, comprising:
- providing a catheter assembly including a catheter shaft having proximal and distal ends, and a balloon having proximal and distal ends with an inflatable interior and a distal shaft section with an interior surface;
 - providing a tip member having proximal and distal ends;
 - positioning the distal end of the catheter shaft within the interior of the balloon distal shaft section and terminating at a point distal to the balloon distal end;
 - providing adhesive along the exterior surface of the catheter shaft extending underneath the balloon distal shaft;
 - positioning the proximal end of the tip member adjacent the balloon distal end;
 - bonding at least a portion of the balloon distal shaft section to the catheter shaft;
 - bonding at least a portion of the balloon distal shaft section to the tip member; and
 - forming the distal tip portion of the catheter.

14. The method of Claim 13 further including curing the adhesive.



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WHAT IS CLAIMED IS:

1. A balloon catheter having a distal end, comprising:
 - an elongated catheter shaft having a proximal end, a distal end, a proximal shaft section, a distal shaft section, a guidewire receiving lumen extending along at least a portion thereof to a port at the catheter shaft distal end, and an inflation lumen;
 - a balloon on the distal catheter shaft section and having an inflatable interior in fluid communication with the inflation lumen, proximal and distal ends, a proximal balloon shaft section adjacent the balloon proximal end, and a distal balloon shaft section adjacent the balloon distal end and being adhesively secured to the catheter shaft; and
 - a tip member on the distal end of the catheter having proximal and distal ends and being in fluid communication with the catheter shaft guidewire receiving lumen; the proximal end adhesively joined to the balloon distal shaft section and the catheter shaft.
2. The catheter of Claim 1 wherein the catheter shaft extends distally beyond the balloon distal end.
3. The catheter of Claim 2 wherein the tip member proximal end forms a butt-joint with the balloon distal shaft section.

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4. The catheter of Claim 3 wherein the tip member proximal ends extends proximally over the distal end of the catheter shaft.
 5. The catheter of Claim 2 wherein the distal balloon shaft forms a lap-joint with the proximal end of the tip member.
 6. The catheter of Claim 2 wherein the distal end of the catheter shaft extends distally beyond the balloon distal end in a range from about 1.0 to about 5.0 millimeters.
 7. The catheter of Claim 6 wherein the distal end of the catheter shaft extends distally beyond the balloon distal end in a range from about 1.0 to about 5.0 millimeters.
 8. The catheter of Claim 4 wherein the proximal end of the tip member extends distally over the catheter shaft in a range from about 0.1 to about 0.5 millimeters.
 9. The catheter of Claim 8 wherein the proximal end of the tip member extends distally over the catheter shaft in a range from about 0.1 to about 0.5 millimeters.

10. The balloon catheter of claim 1 wherein the catheter shaft comprises an outer tubular member defining the inflation lumen and an inner tubular member disposed within at least a portion of the outer tubular member and defining at least in part the guidewire receiving lumen, the inner tubular member having a distal end extending through the balloon interior and extending distal to the balloon distal end.

11. The catheter of Claim 1 wherein the adhesive for forming the adhesive seal between the balloon distal shaft section and the catheter shaft extends along the length of the balloon distal shaft section.

12. The catheter of Claim 2 wherein the adhesive for forming the adhesive seal between the catheter shaft and the balloon distal shaft section and catheter shaft section and the tip member

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13. A method of forming a distal tip portion of a balloon catheter, comprising:
- providing a catheter assembly including a catheter shaft having proximal and distal ends, and a balloon having proximal and distal ends with an inflatable interior and a distal shaft section with an interior surface;
- providing a tip member having proximal and distal ends;
- positioning the distal end of the catheter shaft within the interior of the balloon distal shaft section and terminating at a point distal to the balloon distal end;
- providing adhesive along the exterior surface of the catheter shaft extending underneath the balloon distal shaft;
- positioning the proximal end of the tip member adjacent the balloon distal end;
- bonding at least a portion of the balloon distal shaft section to the catheter shaft;
- bonding at least a portion of the balloon distal shaft section to the tip member; and
- forming the distal tip portion of the catheter.

14. The method of Claim 13 further including curing the adhesive.



ABSTRACT

[0039] A balloon catheter having a distal end, including an elongated catheter shaft having a proximal end, a distal end, a proximal shaft section, a distal shaft section, a guidewire receiving lumen extending along at least a portion thereof to a port at the catheter shaft distal end, and an inflation lumen; a balloon on the distal catheter shaft section and having an inflatable interior in fluid communication with the inflation lumen, proximal and distal ends, a proximal balloon shaft section adjacent the balloon proximal end, and a distal balloon shaft section adjacent the balloon distal end and being adhesively secured to the catheter shaft; and a tip member on the distal end of the catheter having proximal and distal ends and being in fluid communication with the catheter shaft guidewire receiving lumen; the proximal end adhesively joined to the balloon distal shaft section and the catheter shaft.